DOCUMENT RESUME

ED 246 862 IR 011 194

AUTHOR	Mojkowski, Charles
TITLE	Guide to Software Selection Resources: Part Three. Reading and Communication Skills.
INSTITUTION	New York State Education Dept., Albany. Center for Learning Technologies.; Northeast Regional Exchange, Inc., Chelmsford, MA.
SPONS AGENCY	National Inst. of Education (ED), Washington, DC.
PUB DATE	Nov 83
GRANT	NIE-G-82-0017
NOTE	30p.; For Part Two, see ED 237 064; for Part One, see IR 011 193.
PUB TYPE	Guides - Non-Classroom Use (055) -- Reference Materials - Directories/Catalogs (132) -- Tests/Evaluation Instruments (160)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Check Lists; Computer Assisted Instruction; *Courseware; Elementary Secondary Education; *English Instruction; *Evaluation Criteria; Evaluation Methods; *Information Networks; Information Sources; *Language Arts; Media Research; Media Selection
IDENTIFIERS	*Software Evaluation

ABSTRACT

Third in a series, this loose-leaf guide reviews resources for evaluating, selecting, and using software for teaching reading and communication skills. Sources of educational software listed include both commercial publishers and public domain sources. Software selection information sources are divided into journals, newsletters, and special publications; information clearinghouses; and human resources. Automated information clearinghouses are also listed. A checklist (originally prepared by the National Council of Teachers of English Committee on Instructional Technology) contains descriptive, application, and evaluative criteria for use with language arts and general purpose software. Evaluation criteria related to reading and communication skills are discussed, and a section on software application reviews some educational principles and practices related to integrating software with the teaching of English, reading, and writing. A brief discussion summarizes research findings on the effectiveness of computer assisted instruction. Twenty-three references are listed. (LMM)

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GUIDE TO SOFTWARE SELECTION RESOURCES:

PART THREE

READING AND COMMUNICATION SKILLS

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The development of this publication was supported through a subgrant from the Northeast Regional Exchange, Inc., which is funded by the U.S. Department of Education, National Institute for Education, under grant number NIE G–82–0017. The opinions expressed in this publication do not necessarily reflect positions or policies of the U.S. Department of Education or the Northeast Regional Exchange, Inc.

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Acknowledgments

Parts I and III of this **Guide** were written by Charles Mojkowski of Educational Consulting Services, Cranston, RI. Part II was prepared by Nancy Baker Jones of the Southwest Educational Development Laboratory and Larry Vaughan of the Northeast Regional Exchange, Inc.

Robert Caldwell, chairman of the National Council of Teachers of English Committee on Instructional Technology, provided resource information used in Part III.

Foreword

As with all instructional material, the selection of appropriate educational computer software is one of the most important responsibilities of teachers and administrators. In these early stages of the development of educational applications of the microcomputer and other interactive learning technologies, it is important to establish a strong foundation for our uses of these powerful new tools. Unfortunately, it has become commonplace to hear criticism of much of the available microcomputer educational software. Unless high quality materials are used appropriately, the power of the technology will be wasted.

Recognizing the critical role of software in computer-based teaching and learning, the Center for Learning Technologies of the New York State Education Department and the Northeast Regional Exchange are pleased to provide this resource series for teachers and administrators. It provides information on resources and tools for locating software and assessing its appropriateness for various instructional applications. The purpose of the series is not to identify "good" software for educators, but to provide a means through which teachers can make decisions about appropriateness and quality within the context of their curriculum and instructional needs.

This **Guide to Software Selection Resources** has been designed as a resource series to aid the decision making process in schools. The series includes both generic and content area resources. Part III is the first of the content-specific materials; it focuses on reading and communication skills. Continued collaboration between the Center for Learning Technologies and the Northeast Regional Exchange will yield additions to this **Guide** that focus on mathematics, science, and other curriculum priorities.

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Overview

The purpose of this **Guide to Software Selection Resources** is to provide teachers and administrators with a reference tool for identifying, evaluating and selecting software for use in computer-based teaching and learning. The **Guide** is organized as a series of modules that deal with different aspects of the process.

Part I provides an overview of software selection and general educational technology resources in New York State. This section serves as a preamble to the remaining sections of the **Guide**, which deal with software selection resources in specific content areas. Special emphasis is placed on the organizational and material resources that are available throughout New York State to assist educators in implementing meaningful applications of computer technology, particularly software.

Part II is a general purpose introduction to evaluating software. Prepared by the Northeast Regional Exchange, Inc. and the Regional Exchange of the Southwest Educational Development Laboratory, **Evaluation of Educational Software: A Guide to Guides** serves as a introduction to criteria, procedures and sources of software evaluation information.

Part III deals with software selection information and procedures relating to reading and communication skills. Subsequent updates of the **Guide** will deal with additional subject areas, as well as new general purpose resources. A section on mathematics and science software is presently under development and will be available as Section IV of this **Guide** in late winter, 1984.

A number of assumptions explain the approach we take in the **Guide:**

- Software evaluation and selection is only one component of a comprehensive computer program development and implementation process. This process requires the identification and use of a wide range of information and assistance resources available throughout New York State.
- The selection and evaluation of software is primarily an educational task and only secondly a technical one. However powerful and sophisticated the microcomputer may be, the pedagogical quality of the software is what determines its value in supporting teaching and learning. Thus, while evaluation of software may be a relatively new activity, the evaluation of traditional instructional materials has been taking place for many years. Such evaluation forms the foundation for selecting software.
- Evaluating instructional materials requires an understanding of the teaching and learning context in which the materials will be used. What is "good" instructional material in one setting may be unacceptable in another. For this reason, we have avoided evaluating or recommending specific software. This is not to say that software evaluation is solely a matter of individual judgment; there are accepted standards and procedures that can be applied. This **Guide** deals with such standards, and explains how they can be used by teachers and administrators.

- The amount of software is growing rapidly, as are sources of information about it. This manual presents a "snapshot" of information available presently. Updates will be prepared as time and resources permit, helping teachers and administrators to keep up with new developments.

The loose-leaf format of the **Guide** allows you to add your own resources, as well as incorporate the updates provided by the Center for Learning Technologies. The Center would appreciate receiving copies of materials you identify so that they may be included in future editions. Please send them to:

Center for Learning Technologies
New York State Education Department
Cultural Education Center
Empire State Plaza
Albany, NY 12230

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INTRODUCTION

This part of the **Guide** is devoted to a review of resources for evaluating, selecting, and using software in teaching reading and communication skills.

Perhaps it is because the field is so new, or because most teachers of English, reading and writing view the microcomputer as unrelated to their teaching, but for whatever reason, the amount of information dealing exclusively with software evaluation and selection in these subject areas is quite small. In most cases, the reader will do well to use the general materials and procedures described in Part I of this **Guide**. There are some other useful resources, however, and their number and variety are likely to increase rapidly as writers and publishers begin to focus on software selection and application from specific subject matter perspectives.

We assume the reader is familiar with general purpose software evaluation methods and resources such as those described in Part II, **Evaluation of Educational Software: A Guide to Guides** and Part I **Educational Technology Resources in New York State**. In addition to the general questions addressed in those sections, this part responds to the following questions asked by English, reading and writing teachers who are beginning to use microcomputers.

- Where can I find software for teaching reading and communication skills?
- Where can I find out what descriptive and evaluative information is available on software used in teaching reading and communication skills?
- What subject-matter standards can I use to assess the quality of the software available?
- Where can I find information to help me use software in my teaching?

SOURCES OF EDUCATIONAL SOFTWARE

Many general purpose educational software evaluation publications include sections devoted to software for teaching reading and communication skills. Following are some specific resources that should be reviewed:

Commercial Publishers

The National Council of Teachers of English has identified the following publishers as having software in the English Language Arts:

Milton Bradley Company
Education Division
443 Shaker Road
East Longmeadow, MA 01028

Minnesota Educational Computing Consortium
3490 Lexington Avenue North
St. Paul, MN 55112

Scholastic Microcomputer Instructional Materials
904 Sylvan Avenue
Englewood Cliffs, NJ 07632

Selected Microcomputer Software
Opportunities for Learning, Inc.
8950 Lurline Avenue
Dept. 26CD
Chatsworth, CA 91311

Vanloves Apple II/III Software Directory
Vital Information, Inc.
350 Union Station
Kansas City, MO 64106

Miliken Publishing Company
1100 Research Boulevard
St. Louis, MO 63132

Science Research Associates
High School Division
155 N. Wacker Drive
Chicago, IL 60606

BLS, Inc.
Random House School Division
400 Hahn Road
Westminster, MD 21157

Courseware Associates, Inc.
8710 Park Lane
Suite C
Dallas, TX 75231

The Micro Center
Dept. S-4
P.O. Box 6
Pleasantville, NY 10570

In addition to instructional software, teachers of communications skills will be interested in identifying general purpose word processing software. This category includes not only text editors, but spelling and grammar checkers. Because much of this software is not used exclusively or even primarily in education, other sources are needed to identify what is available. Nearly every computer journal has carried an article on word processing software. The following sources are samples of those articles.

- "Word Processing: Finding the Right Software," by David Gabel in *Personal Computing*, April 1983, pp. 103-29 and 171.
- "In Search of a Word Processor," by Ernest E. Mau in *Creative Computing*, June, 1983. Much of the issue is given to evaluations of about a dozen software packages.
- "InfoWorld's Guide to Word Processing Programs," by Tom Shea and Kathy Chin in *InfoWorld*, January 17, 1983, pp. 27-31. Includes comparison chart and glossary of terms related to word processing software.

Word processing software and its educational applications will be discussed in following pages. The bibliography lists some references relating to using commercial word processing software in the classroom.

Another area where commercial publishers have produced software of interest to teachers of reading and communication skills is preparation for the Scholastic Aptitude Tests. The chart on the following page describes ten packages currently on the market.[1] (Note: SAT software is discussed later.)

Public Domain

All of the public domain software cited in Part II, **Evaluation of Educational Software: A Guide to Guides**, (pages 83-86) have offerings for reading and communication skills. Contact those organizations directly for specific information. An additional public domain source is:

- The Educational Computing Network, 12680 Hollyglen, Riverside, CA 92503. The Network offers free software programs for English teachers in areas such as vocabulary building and review, poetry, spelling, vowels, and parts of speech Programs run on Apple II+ and IIe. Send self-addressed, stamped envelope to Keith L. Drieberg at the Network address.

[1]"To Succeed on the SAT." **Electronic Learning**. April, 1983, pp. 52-55.

Ten SAT Preparation Programs

COMPANY NAME	PROGRAM/ PRICE	HARDWARE	DESCRIPTION	MANAGEMENT/ NO. OF STUDENTS	SUPPLEMENTARY MATERIALS	BACKUP/TURN AROUND TIME	PREVIEWING	UPDATING/ COST	TIMING/ SCORING
Bear Incorporated Hofstra University Reading Center Att: Mrs. A. M. Patterson Hempstead, NY 11550 (516) 746-0972	Verbal SAT/ Part 1: $55.00 Part 2: $55.00 Package: $100.00	PET (16K)	Stresses language skills. Correct answers provided with explanations.	No	35 worksheets and teacher's manual	Free backup/ one week	No	Yes	15 minutes per test/SAT scoring formula
Borg-Warner Educational Systems 600 West University Drive Arlington Heights, IL 60004 (800) 323-7577	College Entrance Exam Preparation (Verbal and Math)/Part 1: $575 ($75/first year rental); Part 2: $875 ($105/first year rental)	Apple II (48K)	Three modes: timed test, lesson, and information. Explanations in lesson and information modes.	Yes/85 students	Teacher's guide with references	Free backup/ 10 days	On a selective basis	Yes/reduced rate	20 seconds per question. Teacher may adjust time/ SAT scoring formula
Edu-Ware Services Inc. 28035 Dorothy Dr. Agoura Hills, CA 91301 (213) 706-0661	SAT Word Attack Skills/ $49.95	Apple II (48K)	Vocabulary builder: explains wrong answers with option to explain correct answers.	No	Manual with brief bibliography	Backup available/ one week	No	Yes/mailing cost	Adjustable timed tests/ Scoring based on percent correct
Coronado Publishers, Inc. 1250 6th Avenue San Diego, CA 92101 (800) 782-9016	The Computer SAT Test Preparation Kit (Verbal and Math)/$399 for 16 disks (four-disk sets) and materials for 20 students	Apple (48K) (TRS-80 available in April; IBM and Atari in June)	Four programs: diagnostic/ prescriptive, verbal and math drills, and electronic vocabulary flash cards. Explanation provided for each question.	Yes/20 students	20 "How to Prepare for the SAT's" books, student guides with worksheets, educator's manual, user's manual	No	Yes	Yes	Yes, SAT formula, raw score, and percentage
Krell Software Corp. 1320 Stony Brook Rd. Stony Brook, NY 11790 (516) 751-5139	SAT Examination and Prep Series (Verbal and Math)/ $299.95 per package	Apple II, TI, Commodore 64, TRS-80, IBM, Atari	Program adjusts itself so students see more of the types of questions they consistently get wrong. Solutions given.	No	None	Backup available/ one week	No	Yes/pay difference between new and old disks	No timing/ SAT scoring formula
MicroLab Inc. 2310 Skokie Valley Rd. Highland Park, IL 60035 (312) 433-7550	English SAT I/ $30.00	Apple II (48K)	Gives explanations for wrong answers. Has test mode and tutorial mode.	No	None	Backup $5/one week	Only through dealers	No	No timing/ Percent incorrect
Microcomputer Workshops 103 Puritan Drive Port Chester, NY 10573 (914) 937-5440	English Achievement I-V/Apple II disk: $39.95; PET cassette: $20; PET disk: $24.95; Total of five disks or cassettes per package	Apple II (48K) PET (32K) PET cassette (16K)	Gives complete explanations of answers at all times.	No	None	Backup $10/one week	30-day preview policy	Yes	No timing/ Same as achievement test scoring

COMPANY NAME	PROGRAM/ PRICE	HARDWARE	DESCRIPTION	MANAGEMENT/ NO. OF STUDENTS	SUPPLEMENTARY MATERIALS	BACKUP/TURN AROUND TIME	PREVIEWING	UPDATING/ COST	TIMING/ SCORING
Program Design Inc. 95 East Putnam Avenue Greenwich, CT 06830 (203) 661-8799	Preparing for the SAT (Verbal and Math)/ cassette: $125 disk: $139.25	Atari cassette (16K) Atari disk (24K) Apple II (32K)	Tutorial program provides explanation for incorrect answers.	No	Copy of booklet "Making the Grade"	Free backup/ one week	No	No	Includes discussion on time strategies/Number correct and incorrect
SEI P.O. Box 7266 Hampton, VA 23666 (804) 826-3777	Verbal Skills/ 3 parts, each $25; package: $60 Math Skills/ Part 1: $25, Part 2: $35; package: $50	Apple II (32K)	User has option to proceed or to be given hints. Has built-in editor.	No	None	Backup $7.50/ one week	30-day preview policy	Yes, if old disk returned	No timing/ Percent correct
National Association of Secondary School Principals 1904 Association Drive Reston, VA 22091 (703) 860-0200	Improving College Admissions Test Scores (Verbal; Math to be released in April)/ $183.75; $725 for six hour videotape	Apple II (48K)	Optional videotape lessons. Disks give series of three clues; review clues until question is answered correctly.	No	Workbook: $5.50; Manual: $10	Free backup/ one week	Yes, demonstration disk	No	No timing SAT scoring formula

[1]"To Succeed on the SAT." Electronic Learning. April, 1983, pp. 52–55 reprinted by permission.

SOURCES OF SOFTWARE SELECTION INFORMATION

Three categories of information resources are used: journals, newsletters and special publications; information clearinghouses; and experienced educators.

Journals, Newsletters and Special Publications

Because the field is so new, there is only one journal devoted exclusively or primarily to the use of computers in reading and language arts.

> **Computers, Reading and Language Arts**. Gerald H. Block, Editor-in-Chief, P.O. Box 13039, Oakland, CA 94661.

This journal publishes detailed articles on practical applications of computers in teaching reading and the language arts; research studies; reviews of software, hardware and books; announcements of forthcoming curriculum materials; a calendar of events; reader surveys; and letters to the editor. (Note: Information taken from a pre-publication announcement.)

Articles on software reviews and applications are beginning to appear in the following subject-matter journals:

> **English Journal**. Published by the National Council of Teachers of English. 1111 Kenyon Road, Urbana, IL 61801
>
> **Language Arts**. Published by the National Council of Teachers of English. 1111 Kenyon Road, Urbana, IL 61801
>
> **The Reading Teacher**. Published by the International Reading Association. 800 Barksdale Road, P.O. Box 8139, Newark, DE 19711

The National Council of Teachers of English and the ERIC Clearinghouse on Reading and Communications Skills have published:

> **Computers in the English Classroom: A Primer for Teachers**. It is available from NCTE (stock no. 08180).

There are no special publications that are devoted to describing and evaluating software in reading and communication skills. The publications cited in Part II contain numerous references in these subject areas, and we include, on the following pages, some sample citations from School Microware Reviews, EPIE, Courseware Report Card, and the Digest of Software Reviews.

Information Clearinghouses

The professional organizations in these subject areas do not maintain clearinghouses dealing with software. The ERIC Clearinghouse on Reading and Communication Skills (RCS), working in collaboration with the National Council of Teachers of English (NCTE) and the International Reading Association (IRA), has produced several information products dealing with computers and instruction in English, reading and writing. These products typically take the form of bibliographies. Sample titles are:

Computers and Reading Instruction
Computers in English
Word Processing and Writing
Computers and Composing
CAI in the English Classroom

While these bibliographies do not deal exclusively or primarily with software descriptions and evaluations, some descriptions of software use are included. ERIC/RCS is located at NCTE's offices. The address is:

National Council of Teachers of English
1111 Kenyon Road
Urbana, IL 61801
217-328-3870

The National Council of Teachers of English has formed a Committee on Instructional Technology which has the following charter:

> To establish guidelines for the development of computer materials and other complex software in the language arts; to develop guidelines for classroom use of new instructional technologies; to define those content areas and process objectives within the English curriculum which best lend themselves to delivery through new instructional technologies; to suggest new uses of technology and needed areas of research in the use of interactive media (e.g., the composing process using word processors; use of computers in teacher training and in adaptive testing); to encourage the use of video-disc technology as a potential medium for instruction, information storage, and quality entertainment; to consider ways of gathering and disseminating teacher-made and/or teacher-tested games, lessons and ideas on how to use computers; to make English teachers at all levels aware of how new technologies can be used to develop skill in language arts.

One of the Committee's first products is a set of guidelines for evaluating software in language arts. These guidelines are included in the following section. The Committee also will address the issue of computer literacy as it relates to computer-based language arts instruction and word processing. NCTE will make available a list of sources of software that can be used in language arts. A publication resulting from the Committee's work is **Computers in the English Classroom: A Primer for Teachers** (NCTE, Stock No. 08180).

In New York State, the following organizations provide information on software used in teaching reading and communication skills.

New York State Reading Association
300 Hayward Avenue
Mt. Vernon, New York 10552
912-942-2700

New York State English Council
P.O. Box 2397
Liverpool, New York 13089
315-652-1118

The Demonstration and Technical Assistance Centers listed in Part I provide descriptive and evaluative information on software, and provide preview facilities as well.

Human Resources

The bibliography lists several experts contributing to the appropriate use of software in teaching reading and communication skills. For information about the work of the NCTE Committee on Instructional Technology, contact:

Dr. Robert Caldwell
School of Applied Health Science Center
University of Texas
Dallas, TX 75235

Others whose work was reviewed in the preparation of this guide are:

John Henry Martin, Jr.
Stuart, FL

D. Midian Kurland
Bank Street College of Education
Center for Children and Technology
610 West 112th Street
New York, NY 10025

Andee Rubin
Bolt, Beranek and Newman, Inc.
50 Moulton Street
Cambridge, MA 02138

Henry Olds, Jr.
Intentional Educations, Inc.
341 Mt. Auburn Street
Watertown, MA 02172

In New York, the Statewide Instructional Computing Network (SICN) is preparing a list of resource persons who are able and available to assist teachers and administrators in a wide range of computer applications, including software evaluation, selection, and use. You can obtain this list by contacting:

Dr. Alan Osterhoudt
Assistant Superintendent
Herkimer BOCES
Gros Boulevard
Herkimer, NY 13350
315-867-2007

Automated Information Clearinghouses

This category includes computer-based information databases that give exclusive or considerable attention to software. All of these databases may be searched (are searchable) over the telephone lines using a microcomputer and a modem. Searching these databases requires some special skills, but the effort is rewarded with access to thousands of references and actual documents and journal articles on software and its applications. Using special "searching" techniques, those articles or documents dealing with a specific topic or software material can be located in minutes and reviewed on the computer monitor. Print documentation is usually available through the mail within a short turnaround time.

> **Resources in Computer Education (RICE).** Developed by the MicroSIFT Project at the Northwest Regional Educational Laboratory, 300 S.W. Sixth Avenue, Portland, OR 97204. Available online from Bibliographic Retrieval Services, 1200 Route 7, Latham, NY 12110.

RICE is a file of information on the educational applications of microcomputers. It has five subfiles, not all of which are available presently:

- Producers, which include all commercial and noncommercial producers of computer-based instructional and administrative software;
- Software Packages, which contains descriptive and evaluative information about known products from producers;
- Computer Literacy, which contains objectives and test items;
- Inventory, which contains numbers of student stations and other data on installations of hardware in schools;
- Project Register, which contains descriptions of research and development projects in K-12 computer applications.

Although all of the files are potentially useful to microcomputer users, the one containing information on software packages is particularly suited to software evaluation. This sub-file may be searched by using the key words that define the kind of information needed. For example, you can identify all of the software that is available for teaching economics in the junior high school, and that will run on a particular microcomputer.

A notable feature of RICE is that it contains evaluation information on much of the software in the file. There is a special section (called a field) of each description that is devoted to evaluation information. This evaluation is based on reviews of the software by educators throughout the country that collaborate with MicroSIFT in evaluating software. RICE descriptions also contain references to reviews in other publications.

> **School Practices Information File (SPIF).** Developed and provided by Bibliographic Retrieval Services, 1200 Route 7, Latham, NY 12110.

SPIF is a file of educational programs, practices and materials. A major portion of the file is devoted to descriptions of software, searchable in much the same manner as the RICE file. SPIF software descriptions typically do not contain evaluation information.

> **Educational Resources Information Center (ERIC).** Produced by the National Institute of Education through contracts with several organizations; available through most of the venders of online databases.

ERIC is the major file of educational information in the country. It has descriptions of all forms of information – research reports, curriculum guides, speeches, programs, journal articles. While ERIC contains few if any software descriptions, it does contain scores of records describing educational applications of microcomputers and software.

Information from all three of these files is available from the Educational Programs and Studies Information Services (EPSIS) in the New York State Education Department. EPSIS may be contacted at:

> New York State Education Department
> Room 330 EB
> Albany, NY 12234
> 518-474-3639

METHODS OF DESCRIBING AND EVALUATING EDUCATIONAL SOFTWARE

The checklists in Part II are useful for describing and evaluating all software. This section deals with information specific to reading and communication skills that should be obtained as a supplement to that in the general checklists. In these subject areas, literature dealing with assessing software has only recently begun to appear in the popular content and professional journals, and is still relatively scarce. The NCTE Committee on Instructional Technology has prepared an evaluation checklist for use with language arts software and general purpose software. This checklist, reproduced on the following pages, contains descriptive, application and evaluative criteria, and is similar to the instruments in Part II.

Essential Descriptive and Application Information

The instruments contained in Part II and that used by the Center for Learning Technologies (see Part I) will serve most requirements in deciding whether undertaking an evaluation of a particular software program is worthwhile. Most of the questions in those checklists can be applied to general-purpose software (such as those for handling text, data and graphics), that can be transformed into educational software by developing the appropriate support materials for teachers and students. The most popular software in this category is word processing programs, although software that allows students to build information files of resources is coming into use in secondary schools.

Evaluation Criteria Related to Reading and Communication Skills

Although the NCTE instrument is similar to the checklists in Part II, it incorporates a few general items relating to the language arts curriculum (e.g., numbers III-13-15). In addition, it provides supplementary questions for word processing and other general-purpose software. In general, however, checklists will be of limited utility in assessing the content of the software, because they do not adequately take into account the subject matter of the program.

Deciding whether a specific software package is appropriate for specific classroom applications requires an understanding of curriculum standards and guidelines. In addition to the general evaluation criteria listed in Part II and in the NCTE instrument, you will need to assess the software against the standards established at the district and state levels. The following criteria are suggested by the New York State Education Depatment:

Does software used for **writing instruction:**

- reflect an understanding of writing as a process of communication, as well as a way to discover and activate ideas?
- help students generate ideas for writing, select and arrange those ideas, find appropriate modes for expressing them, or evaluate and revise the written product?

NCTE Guidelines for Software Review and Evaluation

PROGRAM: _____

PRODUCER: _____

REQUIRED EQUIPMENT: _____

_____

GRADE LEVEL: _____ COST: _____

OVERALL PROGRAM OBJECTIVES: _____

_____

SINGLE LESSON OBJECTIVES (if you are reviewing one lesson only):

_____

Answer yes or no for the following criteria in Sections I through V.

I. MANAGEMENT FEATURES

_____ 1. Program provides teacher with a management system. (If no, go to Section II.)

_____ 2. Program has record-keeping system that is useful and efficient.

_____ 3. Records are easily retrievable.

_____ 4. Teacher can assign performance levels and otherwise modify or add to records.

II. CONTENT

_____ 1. Content is accurate.

_____ 2. Content is appropriate to grade level for which it is intended.

_____ 3. Content can be modified by student or teacher.

_____ 4. Possible content modifications are appropriate to the subject matter.

_____ 5. Program contributes to the Language Arts curriculum.

_____ 6. Program achieves its purpose.

_____ 7. Program is motivating to students.

III. INSTRUCTIONAL STRATEGY

(Note: If the software you are reviewing is other than tutorial/drill and practice, go to the Guidelines Addendum to complete this section. Then continue with Section IV.)

_____ 1. Program is attractive.

_____ 2. Program provides opportunity for practice.

_____ 3. Practice is sufficient to help ensure mastery.

_____ 4. Examples are provided.

_____ 5. Examples are clear.

_____ 6. Presentation is logically sequenced.

_____ 7. Student has control over rate of presentation.

_____ 8. Feedback for incorrect responses is helpful for discovering correct answers.

_____ 9. Program allows learner to review, repeat, or advance according to performance.

_____ 10. Program reports student performance periodically.

_____ 11. Program provides an appropriate balance between content presentation and student interactions or responses.

_____ 12. Program offers a variety of interactions, varying keys pressed or responses required.

_____ 13. Program stimulates cognitive growth (or a new way of thinking).

_____ 14. Program complements (or enhances) other Language Arts materials.

_____ 15. Program allows meaningful application of Language Arts skills.

IV. EASE OF OPERATION

_____ 1. Directions to student are clear.

_____ 2. Directions are accessible when needed.

_____ 3. Student can operate program independently.

_____ 4. Student is prevented from getting lost in the program, with no way out.

_____ 5. Student is provided with option to quit or continue at any time.

V. SUPPLEMENTARY MATERIAL

_____ 1. Program provides teacher's guide.

_____ 2. Program provides supplementary student materials.

_____ 3. If yes, materials are appropriate and useful.

_____ 4. Program provides pre- and post-tests.

_____ 5. Replacement print materials are available from producer.

OVERALL EVALUATION

Use the scale at the right to rate this program. (1 is lowest.)

I. MANAGEMENT FEATURES 1 2 3 4 5

II. CONTENT 1 2 3 4 5

III. INSTRUCTIONAL STRATEGY 1 2 3 4 5

IV. EASE OF OPERATION 1 2 3 4 5

V. SUPPLEMENTARY MATERIALS 1 2 3 4 5

COMMENTS: What are the program's strengths and weaknesses?

_____

_____

_____

_____

STUDENTS' RESPONSES TO PROGRAM: _____

_____

_____

RECOMMENDATIONS: _____

_____

_____

_____

GUIDELINES ADDENDUM

Choose the description which best fits the software you are reviewing, and repond to each criterion under that heading with a yes or no.

A. SIMULATION/PROBLEM SOLVING (Learning through discovery and decision-making)

_____ 1. Problem-solving situation is realistic.

_____ 2. Design is motivating.

_____ 3. Procedural tasks are clearly sequenced.

_____ 4. Feedback to decisions is helpful.

_____ 5. Suggestions are given for optimum performance.

_____ 6. Outcomes to choices are explained.

_____ 7. The program is relevant to the acquisition of Language Arts skills.

B. EDUCATIONAL GAME

_____ 1. Format is motivating.

_____ 2. Graphics are appropriate to presentation.

_____ 3. Content is appropriate to Language Arts skills.

_____ 4. Learner has access to help or review.

_____ 5. There is an appropriate reward for success and no "reward" for incorrect responses.

_____ 6. Additional information or clues are provided by error feedback.

C. TEACHER UTILITY (A program which allows teacher to "author" the content within a programmed format)

_____ 1. Directions to teacher are clear.

_____ 2. Items are easy to enter.

_____ 3. Editing is possible.

_____ 4. Format for presenting items to student is appropriate.

_____ 5. Student directions are clear.

_____ 6. The type of interaction is appropriate to the skills taught.

_____ 7. Record-keeping is provided.

D. WORD PROCESSING/TEXT EDITING (A program which assists students in the composing process)

_____ 1. Instructions are clear.

_____ 2. Examples are provided.

_____ 3. Practice is provided.

_____ 4. Editing and revising are possible.

_____ 5. Editing capabilities are sufficient to writer's needs.

_____ 6. Editing is easy to perform.

_____ 7. Keys used for editing process are straightforward and easy to understand and manipulate.

_____ 8. Stored data (spelling dictionary, etc.) are appropriate to learner's level.

_____ 9. Teacher can add to stored data.

_____ 10. Learner has access to help or review.

_____ 11. There is provision for printing out compositions.

_____ 12. The program makes a contribution to the composing process.

E. OTHER TYPES OF SOFTWARE

If the software you are reviewing does not fall into any of the above categories, you may wish to give a brief description of it below, followed by your evaluative comments.

_____

_____

_____

_____

_____

_____

_____

_____

help students recognize that precision in punctuation, capitalization, spelling and other manuscript conventions is a part of the total effectiveness of writing?

Does software used for **reading instruction:**

help students learn to approach reading as a search for meaning?

help develop the necessary reading skills to comprehend connected text in a variety of forms?

demonstrate that reading functions are a pleasurable activity as well as a means of acquiring knowledge?

help students to read accurately and make valid inferences?

elicit personal and/or critical responses to literature?

provide students with strategies for organizing, responding to, or crystallizing textual information, rather than merely serving as a vehicle for displaying that infomation?

Does software used for **language instruction:**

help students recognize language as a powerful tool for thinking and learning?

illustrate the ways in which grammar represents the orderliness of language and makes meaningful communication possible?

demonstrate how topic, purpose and audience influence the structure and use of language?

help students learn how the English language has developed, continues to change, and survives because it is adaptable to new times?

provide opportunities for using language beyond the letter, word and sentence levels?

Does software designed to promote **thinking skills:**

help students analyze, classify, compare, formulate hypotheses, make inferences and draw conclusions?

promote creative thinking by providing opportunities to bring fresh perceptions to familiar ideas?

encourage logical thinking by providing opportunities for constructing arguments, detecting fallacies in reasoning, and testing the validity of an assertion by examining the evidence?

foster critical thinking by requiring students to ask questions, discriminate between fact and opinion, and evaluate the intentions and messages of speakers and writers?

Evaluating software tools such as word processing programs requires the use of more specific evaluation criteria that combine those used for general purpose computer software reviews and criteria that reflect the adaptations that will be required to use the software tools in the classroom. An example of a software tool that is transformed into a educatioal software package is **Word Processing on the Apple**, which teaches students the fundamentals of word processing through the use of the Apple Writer I program. The package was developed by the Minnesota Educational Computing Consortium, and includes specially prepared teacher and student support materials to accompany the commercial software program. An evaluation of the software alone is insufficient to assess its utility for classroom use. Only by evaluating the support materials as well can a judgment be made on the quality of the tool as an educational software package.

An example of an empirical evaluation of a software tool is that conducted by Virginia Bradley on three different word processing programs.[1] While the article describing the evaluation does not indicate whether Bradley conducted a review according to criteria such as those in the NCTE checklist, her assessment incorporates criteria related to the ability of the tools to accommodate the capabilities and limitations of her students. Bradley suggests the following characteristics as important in using a word processing program in the elementary grades:

1. A screen editor is vital so that children can see their entire work (or a good portion of it) at one time.
2. The screen should display upper and lower case letters.
3. The text should be displayed in a double-spaced format.
4. Both large, primary type letters and normal sized ones should be displayable by giving a command.
5. Left and right arrow deletion and retrieval functions are well accepted by children.
6. Mnemonic commands that relate to children's vocabularies would be easier for them to learn and remember.
7. A dictionary that checks for spelling and other structural errors would be an extremely useful component.
8. The smallest number of commands possible should be used.
9. A quiet printer is very important to avoid disturbing others in the classroom.

Bradley's assessment illustrates the limitations of generic checklists in evaluating the utility of an educational software program or software tool to be used in a particular subject area. Her additional criteria range from substantive curriculum standards to relatively mundane concerns, such as that for a quiet printer. The best software evaluations will incorporate technical questions, as well as questions about the curriculum and its implementation in the classroom.

[1]Virginia Bradley, "Improving Students' Writing with Microcomputers," **Language Arts**, October, 1982, pp. 732–43.

SOFTWARE APPLICATIONS: PRINCIPLES AND PRACTICES

Selecting high quality software and general purpose software tools is only part of the work of using software meaningfully in the classroom. Careful attention must be given to how the software supports and advances the curriculum and instructional objectives. The journal literature and descriptions of promising practices indicate that meaningful software use by teachers of reading and communication skills is increasing substantially, even though it is a new activity for the vast majority of teachers. This section briefly reviews some educational principles and practices related to integrating software with the teaching of English, reading and writing.

The first question to ask is what uses of the computer students should make, and for what purposes. In teaching reading and communication skills, the most typical modes of use (see "Evaluating the Evaluation Schemes" in Part II) are likely to be as a tutor and as a tool. The literature contains numerous examples of both application modes. If, as many experts indicate, computer literacy will be defined increasingly in terms of an individual's ability to use the computer to perform discipline-related tasks, teachers of reading and communication skills will need to take a leadership role in designing and implementing instructional programs that teach students how to communicate using the computer.

It is this emphasis on the tool mode that has motivated many teachers to incorporate text editing (word processing) into their teaching of creative and expository writing. A few word processing programs for use by elementary grade students have been developed, and teachers are devising ways to teach students to increase the quantity and the quality of their writing using the computer. At the secondary level, teachers are able to use general purpose word processing programs that require greater skill. As Kurland[1] points out, using the computer as a tutor is not revolutionary, since it usually does what the teacher is able to do. But uses of the computer for writing, developing bibliographies and research file databases, and communicating through electronic mail represent step-function differences in the way important communication skills can be taught. It is this kind of literacy that students will require in order to compete in the job market, as well as in post-secondary education.

Given this need to help students acquire computer literacy for communication, the selection of software involves making judgments on the appropriateness of general purpose tools already used in work environments. Application decisions will need to deal with the logistics of using a limited number of computers to accommodate skills development that requires frequent and regular use by all students. The decision to use a software program will require thorough use of the checklists provided, as well as detailed planning in classroom or-

[1]D. Midian Kurland, "Educational Software Tools: The Rationale Behind the Development of the Bank Street Writer." In **Teaching Writing Through Technology: A Resource Guide**. pp. 112–23.

ganization and management. A review of software for use in the tutor and tool modes will serve to illustrate some of the problems in selecting and using appropriate materials.

Software as Tutor

There is a considerable amount of software available in this category. While much of it is criticized as being very limited technically and pedagogically, its usefulness is dependent on how and with whom it is used. Most of the software is drill and practice in mechanics – word recognition, grammar – requiring that the teacher use it within a comprehensive instructional plan. As Roblyer states, the key is "matching what software there is to identified needs in language instruction, and using all of this as the basis of a complete, well-designed program."[1]

Of course, there is better tutor software available, and new development is benefiting from the identification of inadequacies in existing materials. One such development is the Writing to Read program currently being tested by John Henry Martin with support from IBM.[2] The program teaches young children to write and, in doing so, helps them to read. Writing to Read illustrates the way in which high quality computer-assisted instructional material is developed: The content and instructional methods are designed and tested; then the computer is used to support the materials, using all of its unique capabilities. This includes using true interaction, in which the computer adjusts its responses to the student's.

SAT courses are another application of tutorial software. Responding to the resurgence of interest in SAT scores (and to research which finds that "teaching" the SAT produces performance gains), educators are offering special tutorial classes. Because of the SAT emphasis on verbal skills, English teachers usually take a coordinating role in preparing and conducting classes. Publishers are bringing several new programs to market for use in formal classes or in self-study applications. Evaluating and selecting a program involves using specific criteria related to these various applications. In addition to applying general descriptive, application and evaluative criteria, the following questions need to be addressed:

- Does the software include teacher and/or student management? If so, how many students will it accommodate?
- Are there accompanying or reference materials?
- Is the program regularly updated to incorporate changes in the SAT?
- How much instruction does the program offer? (the quantity of instruction ranges from brief hints to lengthy tutorials)
- What is the turnaround time for backup disks?
- Does the program include a timed practice test?
- Is the practice test or any other portion of the program scored? If yes, how?
- Does the program have graphics and sound?[3]

Software as Tool

The most common application of software tools is the teaching of writing using word processing software. It is likely that future classes in communication skills will include the use of electronic mail systems, online computerized databases (e.g., newspaper files or encyclopedias), and electronic filing systems which allow students to create bibliographies and research files on the computer. At present, however, these uses are uncommon, and word processing tools are receiving most of the attention of teachers of communication skills.

Of the scores of word processors on the market, only a few are appropriate for use in education without considerable modification, particularly for upper elementary level students. Two education-specific programs are cited here: The Bank Street Writer and QUILL.

The Bank Street Writer (available from Broderbund Software, 1938 Fourth Street, San Rafael, CA 94901 and Scholastic, Inc., 902 Sylvan Avenue, Englewood Cliffs, NJ 07632) was developed by Intentional Educations, Inc. and Bank Street College of Education. It is for the beginning writer, incorporating tested instructional methods with technically simple software. The program is designed to support the teaching of writing. For example, the student is encouraged to communicate without worrying about mechanics (i.e., spelling, punctuation, paragraphing). In fact, the program discourages the student from editing and rewriting until s/he has completed the creative process. Only then

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[1] M.D. Roblyer, "Recommendations on Remedial Reading/Writing Labs," **Educational Computer**, May/June, 1983, p. 36.

[2] Leigh E. Zeitz, "Children Should Learn to Read by Learning to Write," **InfoWorld**, May 23, 1983, pp. 17-21.

[3] "To Succeed on the SAT," **Electronic Learning**, April, 1983, p. 52.

can s/he switch to the edit function and begin the more tedious process of rewriting. Such a technical design is consistent with correct teaching of the writing process.

A more comprehensive set of writing software tools is QUILL, a program developed by Bolt, Beranek and Newman, Inc., of Cambridge, Massachusetts and The NETWORK, Inc. of Andover, Massachusetts. The software is for students in grades 3-6, and has four components:

> The PLANNER enables the writer to organize thoughts by posing a series of questions that when answered are a plan for creating a written piece.
>
> The WRITER'S ASSISTANT is a text editing system for children that makes producing and revising what they have written easier.
>
> The LIBRARY is an information storage system that allows students to produce and share information about topics of study and interest.
>
> The MAILBAG is an electronic message system that encourages students to communicate via computer, as they will be doing in the near future.

QUILL provides more than tools for processing words; it encourages creative written communication by providing motivations and opportunities for writing. QUILL is a modification of more sophisticated software available in business and industry; it helps students to become literate in the use of computer tools while learning basic writing skills.

If QUILL represents the kind of computer skills that students will need to communicate in college, work, and the home, then teachers of communication skills will need to incorporate them into their curriculum. It is likely that more sophisticated microcomputers and software will merge the tutorial and tutor modes. This would allow students, for example, to use word processing software to create a report, and then use spelling and grammar checkers that not only identify errors, but provide students with appropriate instruction, while keeping records for the teacher on the lessons provided.

Summary

While the amount of available information dealing exclusively with reading and communication skills is small, general purpose criteria and procedures are applicable in most cases. Use of the criteria developed by the New York State Education Department as a supplement to a rating instrument will help to customize the evaluation and selection process for reading and communication skills.

The predominant uses of the computer in developing reading and communication skills will be as a tutor and as a tool. The range and quality of tutorial software is increasing, but incorporating such software into the existing curriculum will continue to be the most difficult problem facing teachers.

Perhaps the most potent and pervasive use of the computer will be as a text preparation and editing tool. Although research is scant and inconclusive, it appears that word processing tools can be used to promote creative communication and the development of the revision and editing skills essential to good writing.

EFFECTIVENESS: WHAT THE RESEARCH SAYS

There is a considerable amount of research available on the effectiveness of computer-based instruction, most of it on the use of the computer as a tutor. For both the drill and practice and tutorial modes, the research concludes that computer-based instruction raises student achievement from the fiftieth percentile to about the sixty-fifth percentile. This conclusion was derived by reviewing scores of studies done at many sites over multi-year periods.

Most of the research to date has been done at the secondary school level across all of the subject areas, but primarily in math and science. Only a few studies have been conducted at the elementary school level, but findings from these tend to parallel those for the secondary level. One researcher, examining studies conducted over several years, concluded that computer-based instruction was not as effective as peer or cross-age tutoring.[1]

The time required to learn specific material is usually considerably less for computer-based delivery. Costs are at least comparable to those for traditional instruction.

All of this research focused on the computer as a tutor. There is no conclusive research on the effectiveness of the computer used as a tool. For example, little is known on the impact of using a computer as a word processor to develop writing skills. This is understandable given the recent use of word processing in schools. It probably will be several years before there are definitive studies in this area.

For those wishing to review the research on computer-based instruction, the following references will serve as an introduction.

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[1] James Kulik "Synthesis of Research on Computer-Based Instruction," **Educational Leadership**, September, 1983, p. 19.

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